CALIFORNIA HYDROGEN HIGHWAY NETWORK

RENEWABLE HYDROGEN STATIONS IN CALIFORNIA

Honda Solar-Powered Hydrogen Fueling Station

Location: Honda R&D America research facility in Torrance, CA.

Purpose:

- Conduct studies on hydrogen production, storage, and fueling using renewable energy sources
- Support the company's ongoing fuel cell-powered vehicle development program

Project Description:
The station was opened in July 2001, and was the company's first solar powered hydrogen production and fueling station. The facility uses solar energy to extract hydrogen from water through the process of electrolysis. Grid energy is used to produce hydrogen when solar power is insufficient or unavailable, such as cloud coverage or in evenings.

Hydrogen Production Capacity:
The system, when running exclusively on solar energy, can produce about 5,700 liters of gaseous hydrogen per year. This is enough to fuel one vehicle. By using both solar power and electricity from the grid, the station's production capability is 26,000 liters per year. Cars can be fueled at the rate of 20 liters per minute, and mass flow sensors record the amount of fuel delivered.

Hydrogen Storage Capacity:

- Includes a compressed hydrogen storage tank with a capacity of 400 liters.
- Can store 5000 psi of compressed hydrogen

Schatz Energy Research Center (SERC) Stationary Fuel Cell

Location: The Humboldt State University's Telomicher Marine Laboratory in Trinidad, California.

Purpose:

- Research and development while using solar hydrogen
- To learn how to store photovoltaic power as hydrogen, and retrieve this stored energy through a fuel cell

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Project Description:
The project uses energy from the sun to generate electricity and produce hydrogen fuel that powers the facility when the sun is not available.

Hydrogen Production Capacity:
- 6 kilowatt electrolyzer that produces 20 standard liters of hydrogen per minute (max) at 100 psi.

Hydrogen Storage Capacity:
- Three 500 gallon tanks for hydrogen and oxygen with a working storage of 250 psi.

Sunline Transit Agency Hydrogen Fueling Station

Location: Opened in 1994 and is located outside of Palm Springs in Coachella Valley, CA.

Project Description:
From 1998-2001, the program was to produce hydrogen via electrolysis using solar energy. In April 2000, this was the first American facility to generate hydrogen from renewable resources. The facility used hydrogen in fuel cells and internal combustion engines (ICE).

Hydrogen Produced with Solar Energy:
- From 1998-2001, the facility could produce 42 cu. ft. of hydrogen per hour, and about 1 kg per 10 hours
- Used to fuel neighborhood electric type vehicles
- Currently, averages 23.5 kW per hour, which feeds into the cities power grid

Hydrogen Produced with Wind Energy:
- Three wind turbine engines in the Coachella Valley w/ capacity of 65 kW/hour
- Assuming optimal season conditions, the facility can generate 5,800 kg of hydrogen per year

Future Plans:
Sunline currently operates one hydrogen fueled ICE bus and two hydrogen-compress natural gas (CNG) busses. In the fall, Sunline will operate one hydrogen fuel cell bus that will use hydrogen produced from both solar and wind energy.